

T17D05 – 17.1-2 IB Practice Questions MS

1. A
2. D
3. No ECF throughout this question.
- (a) $K_c = \frac{[\text{N}_2\text{O}_4]}{[\text{NO}_2]^2}$ 1
- (b) K_c decreases;
forward reaction is exothermic/ ΔH is negative/equilibrium moves to left/OWTTE; 2
- (c) (mixture will get) darker/darker than expected;
equilibrium position moves to the left/towards reactants as there is an increase in the number of moles of gas from right to left; 2
- (d) (equilibrium mixture contains) less (than 2 moles NO_2);
given values make $\frac{[\text{N}_2\text{O}_4]}{[\text{NO}_2]^2} = \frac{1}{2}$ i.e. too much NO_2 /OWTTE; 2
4. (a) (i) no effect;
equal gas moles on each side; 2
- (ii) shift to right;
forward reaction absorbs heat/endothermic/OWTTE; 2
- (iii) no effect;
catalyst speeds up both forward and reverse reactions equally; 2
- (b) $K_c = \frac{[\text{H}_2][\text{I}_2]}{[\text{HI}]^2}$; 1
Ignore state symbols.
- (c) (i) *experiment 1* $[\text{HI}] = 0.04 \text{ (mol dm}^{-3}\text{)}$;
 $[\text{I}_2] = 0.01 \text{ (mol dm}^{-3}\text{)}$;
 $K_c = \frac{(0.01)^2}{(0.04)^2} = 6.25 \times 10^{-2}$;
ECF from above values.
experiment 2 $[\text{H}_2] = 0.02 \text{ (mol dm}^{-3}\text{)}$;
 $[\text{I}_2] = 0.02 \text{ (mol dm}^{-3}\text{)}$;
 $K_c = \frac{(0.02)^2}{(0.04)^2} = 0.25$; 6
ECF from above values.
- (ii) *experiment 2* (at higher temperature);
higher K_c value/equilibrium shifted to right; 2

[7]

[15]